

WHAT IS CLAIMED IS:

1. A system for urging a sample well tray away from a sample block, comprising:  
a sample block having a plurality of openings for receiving sample wells of a sample well tray therein; and  
at least one urging mechanism interposed between the sample block and the sample well tray to urge the sample wells away from the openings in the sample block.
2. The system of claim 1, wherein said urging mechanism is engageable with the sample well tray.
3. The system of claim 1, wherein said urging mechanism comprises a plurality of spring devices.
4. The system of claim 3, wherein at least one of said spring devices is positioned about an outer periphery of the sample block in a region outside of the openings in the sample block.
5. The system of claim 4, the sample block further comprising at least one receiving portion for receiving a portion of said at least one spring device.

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6. The system of claim 5, wherein said at least one spring device comprises a coil spring.

7. The system of claim 6, wherein the receiving portion comprises a cylindrical opening for accommodating a portion of the coil spring.

8. The system of claim 3, wherein said plurality of spring devices are positioned substantially symmetric around the periphery of the sample block.

9. The system of claim 1, wherein the urging mechanism is positioned between the sample block and the sample well tray.

10. The system of claim 1, wherein the urging mechanism comprises a plurality of spring devices spaced around an outer periphery of a top surface of the sample block, said spring devices being accommodated in cylindrical openings in the sample block, said spring devices engaging a bottom surface of the sample well tray in order to disengage the sample well tray from the sample block upon opening of a cover for the system.

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11. The system of claim 1, further comprising a sample well tray holder for holding the sample well tray, said sample well tray being movable relative to the sample well tray holder.

12. The system of claim 11, wherein said urging mechanism biases the well tray holder away from the sample block to thereby urge the sample wells to urge the openings in the sample block upon the opening of a cover for the sample well.

13. The system of claim 12, wherein said urging mechanism comprises a plurality of spring devices.

14. The system of claim 13, wherein a portion of the spring devices are attached to the sample well tray holder.

15. The system of claim 14, wherein the spring devices are positioned substantially uniformly around an opening for the sample well tray on the bottom of the well tray holder.

16. The system of claim 15, comprising four of said spring devices.

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17. The system of claim 15, wherein said spring devices comprise leaf springs.

18. The system of claim 1, wherein the sample wells received by the sample block are sized to have a fluid volume in the range of 10 to 500 $\mu$ L.

19. A heating apparatus for biological samples, comprising:  
a cover;  
a sample block having a plurality of openings in a top portion thereof for receiving a sample well tray having a plurality of sample wells; and  
an urging mechanism positionable between the sample block and the sample well tray to urge the sample well tray away from the sample block when the cover is moved from a closed position toward an open position,  
wherein said cover imparts a downward force on the top of the sample well tray to press the sample wells into the openings of the sample block when the cover is moved toward a closed position, said urging mechanism imparting an upward force on the sample well tray, and wherein said downward force imparted by the cover is sufficient to retain the sample well tray against the sample block when the cover is in said closed position.

20. The heating apparatus of claim 19, wherein a sample well tray is positionable between the cover and the sample block when the cover is in a closed position.

21. The heating apparatus of claim 20, wherein the urging mechanism comprises at least one spring device engageable with the sample well tray and the sample block.

22. The heating apparatus of claim 21, wherein the at least one spring device engages the sample block, the at least one spring device being positioned on a surface of the sample block radially outside of the openings in the sample block.

23. The heating apparatus of claim 22, wherein the sample block further comprises a plurality of cylindrical spring openings for receiving a plurality of the spring devices of the urging mechanism.

24. The heating apparatus of claim 21, further comprising a sample well tray holder, the sample well tray holder supporting the sample well tray, the sample well tray being movable relative to the sample well tray holder.

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25. The heating apparatus of claim 24, wherein the urging mechanism is positioned on a bottom surface of the sample well tray holder.

26. The heating apparatus of claim 25, wherein the urging mechanism includes a plurality of springs.

27. The heating apparatus of claim 26, wherein the sample well tray holder may be pressed downward by an outside portion of the heated cover so that the sample well tray becomes disengaged from the sample well tray holder, the urging mechanism no longer imparting an upward force on the sample well tray in this position.

28. The heating apparatus of claim 27, wherein the sample well tray receives said upward force from the sample well tray holder when the outside portion of the heated cover is no longer pressed downward so that the sample well tray holder engages the sample well tray.

29. A system for urging a sample tray for biological material away from a base of the system, comprising:

a base configured to be engageable with a sample tray; and

at least one urging mechanism interposed between the base and the sample tray to urge the sample tray away from the base.

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30. The system of claim 29, wherein the base includes a plurality of openings for receiving sample wells of the sample tray, said sample wells being urged away from the base during operation of the urging mechanism.

31. The system of claim 29, wherein the urging mechanism engages a sample tray with a flat upper surface for receiving samples of a biological material.

32. A method of manipulating a sample well tray with respect to a sample block, comprising the steps of:

providing an initial downward force on a sample well tray, said initial downward force pressing sample wells of the sample well tray into openings on a top surface of a sample block; and

providing an upward force on the sample well tray, the upward force being provided by an urging mechanism interposed between the sample block and sample well tray.

33. The method of manipulation of claim 32, further comprising the steps of reducing the initial downward force on the sample well tray, and urging said sample well tray from the sample block by an upward force between the sample well tray and the sample block.

34. The method of manipulating of claim 33, further comprising the step of removing the sample well tray from the sample block by a robotic mechanism.

35. The method of manipulating of claim 32, wherein the step of providing an upward force on the sample well tray is performed by a spring system of the urging mechanism including at least one spring device in communication with the sample block.

36. The method of manipulating of claim 35, wherein during the step of providing an upward force on the sample well tray, a plurality of spring devices engage with the sample well tray.

37. The method of manipulating of claim 35, wherein during the step of providing an upward force on the sample well tray, a sample well tray holder is provided for pressing the sample well tray in an upward direction.

38. The method of manipulating of claim 37, wherein prior to the step of providing an upward force on the sample well tray, the upward force imparted on the sample well tray holder by the spring system is substantially isolated from the sample well tray, so that substantially no upward force is imparted on the sample well tray holder by the sample well tray during a heating procedure performed by the apparatus.



39. A mechanism for urging a sample tray away from a sample block in a biological sample heating device, comprising:

a spring positioned between the sample block and sample tray, said spring having a sufficient force in a compressed state to move the sample tray in a direction substantially away from the sample block in response to opening a cover away from the sample tray.

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